

## REMARKS

Claims 1-18 have been rejected in the present application, and a new title of the invention is requested. Applicant has amended the title of the invention. Applicant has amended claims 1, 2, 3, 5, 6, 8, 11, 12, and 15. Reconsideration and reexamination of pending claims 1-18 is respectfully requested.

The title of the invention is not descriptive and imprecise. A new title is required which should include more claimed features which differentiate the claimed invention from the Prior Art. The main idea or the improvement of the present invention should be reflected within twenty words. Specifically, the title should stress the use of 'proxy' objects in addition to the translation of a 'language-based' message to an 'operating system-based' message. In general, the title should cite a method of message passing. Applicant has amended the Title accordingly.

The Examiner has objected to the disclosure because of the following informalities:

- (a) In figure 1, blocks 101, 102, 103 & 104 are not labeled.
- (b) Figures 6, 7 & 8b are not labeled as prior art. Appropriate correction is required.

Applicant submits herewith informal drawings with corrections indicated in red.

The Examiner has objected to the specification under 35 U.S.C. § 112, first paragraph, as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure. It is unclear how a receiver object determines whether it has been given all the information it needs to execute a message, in order to determine if a query must be generated and sent back to the sender object. On p. 22, paragraph 4, the specification cites

that the present invention supports this feature, but does not fully disclose it. This rejection goes hand in hand with section (c) of the following 35 U.S.C. § 112, second paragraph rejection. This feature must be fully disclosed.

Applicant contends that the feature is fully disclosed and is described on pages 22, 23, and 24 of the originally filed specification. Applicant also refers Examiner to Appendix A of the original filed specification, page 41, lines 25 - 40. Applicant contends that the code of Appendix A teaches and discloses the feature described.

5. The Examiner states that Claims 5-7, 11-18 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification. Applicant contends that the objection is mooted in light of the above.

The Examiner states that claims 1-18 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states that the following claim language is unclear, vague and/or indefinite:

(a) as per claims 1, 2, 5, 6, & 11 it is unclear who or what is executing these steps. If they are executed by a computer, this must be explicitly stated within the context of the claims, and the steps involving 'providing' must be clarified in relation to a computer actually implementing these steps. A computer 'providing' something is not a common art term. It appears to the examiner that these steps do not actually contribute to the claimed method of message sending.

Applicant has amended these claims accordingly.

(b) as per claims 2-10, they are rejected because they depend from previously rejected claim 1. In addition, claims 8 & 9 add irrelevant limitations to the

claims from which they depend. Of what relevance is the use of C and Mach to the method of claim 1?

Applicant contends that claims 2 - 10 are now dependent on an allowable base claim and are therefore themselves allowable.

(c) as per claims 5 & 6, it is unclear how the steps of claim 5 fit into the steps of claim 2, and how the steps of claim 6 fit into the steps of claim 5. Are the steps of these claims executed directly after those of the claim from which they depend? Are they executed every time a message is sent? These seem to be steps which only occur under certain conditions, i.e. the second object needs further information from the first object. This claim must be clarified in conjunction with the above 35 U.S.C. § 112, first paragraph rejection.

Applicant contends that claims 5 and 6 are in proper form and that no further amendment is necessary in light of the mooting of the above section 112 rejections.

(d) as per claims 12-18, they are rejected because they depend from previously rejected claim 11. In addition, claims 15 & 16 add irrelevant limitations to the claims from which they depend. Of what relevance is the use of c and Mach to the method of claim 11?

Applicant contends that claims 12 - 18, being dependent on an allowable base claim, are themselves allowable.

The Examiner states that Claims 1-4, 8-10 are rejected under 35 U.S.C. § 102 (a), (b) & (e) as being anticipated by McCullough, "Transparent Forwarding: First Steps", OOPSLA '87 Proceedings: Conference on Object Oriented Programming, Systems, Languages, and Applications, pp. 331-341, 12/1987, and Bennet, "The Design and Implementation of Distributed Smalltalk", OOPSLA '87 Proceedings: Conference on Object Oriented

Programming, Systems, Languages, and Applications, pp. 318-330, 12/1987.  
McCullough and Bennet both teach all that is claimed in these claims.

As stated in the "BACKGROUND ART" section of the specification, p. 10, paragraph 3, and in the reference, McCullough clearly teaches the use of a 'ProxyObject' and translation (encoding/decoding) of the message before and after transmission. This is taught in both directions, i.e. sending the message and the result. The translation from a language-based message into an operating system-based message is shown in the use of the **doesNotUnderstand:** primitive, the creation of an Ethernet packet, and the linearization of the arguments to the message. These features clearly indicate a system-dependent form of the message which is transmitted to the receiver object. This system-dependent form is then decoded, the message extracted, and the message executed by the receiver object. The result is then transmitted back to the sender in the same manner.

Bennet teaches a similar method of translation. His method includes the use of the **doesNotUnderstand:**, **perform:**, and **remoteSend:** primitives, a 'RemoteObjectTable' which uses a 'messageProcess' to construct a messsageArray, and the encoding of an 'argument string'. These features also indicate a system-dependent form which is used during the transmission of the message.

Applicant respectfully disagrees. Applicant contends that the claims as amended distinguish over the cited art. The present invention is directed to an object oriented programming language based system that includes dynamic binding. This provides features not available to Smalltalk based systems. For example, the Bennett reference does not allow remote classes. Instead, the system requires that classes and instances be co-resident on all processes and machines. This impacts object mobility adversely. Instances can only move to hosts with compatible classes and insuring class compatibility is difficult. In addition, the system of Bennett does not operate in an object-oriented programming system that utilizes class inheritance and reactivity. (Reactivity describes the ability of a system to present objects for inspection or modification). Likewise, McCullough does not operate in an

object oriented programming environment having class inheritance. McCullough requires the use of migration. The use of migration limits the performance and ease of use of these prior art schemes. Migration of objects from their home process adds to the complexity of the system. Another disadvantage is that each process and thread must be forked to anticipate each expected iteration. Both references require substantial run time support to implement communication between processes.

The Examiner states that claims 3 & 4 do not contribute to making the claimed invention distinct from the prior art. The limitation, in claim 3, that the message comprises a method and an argument, is disclosed by Applicant in the 'BACKGROUND ART' section of the specification, p. 1, lines 21-25, and is common in the art. It is also understood in the art that executing a message comprises executing the given method on the given argument, as described in claim 4.

Applicant contends that these dependent claims are dependent on an allowable base claim and are themselves allowable.

The Examiner states that claims 8 - 10 do not make the invention distinct from the prior art. Regarding claims 8 & 9, see the above 35 USC 112, second paragraph rejection. Regarding claim 10, this limitation is understood in the general understanding of the "proxy" concept.

Applicant contends that these dependent claims are dependent on an allowable base claim and are themselves allowable.

For the foregoing reasons, Applicant contends that none of the cited references, either alone or in combination, teach, suggest, or describe the present invention. Applicant respectfully submits that pending claims 1 - 18 are in condition for allowance.

Respectfully submitted,

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